Environmental Sustainability

Overview

The City of Frederick has a considerable diversity of habitat within a relatively small area. Forested lands, streams, a scenic river, open farmland with fencerows, and wooded parcels are all located within a short distance of the City's center. Additionally, the City maintains a 7,500-acre Municipal Forest in the mountains to the northwest of the City, primarily to protect the City's mountain water sources. Beyond the forest, Frederick also serves as a gateway for many local and regional environmental resources in the Catoctin Mountain region.

An important concern for the City of Frederick is to strike a balance between the State of Maryland's environmental regulations and City policies. This regulatory balance is relevant to the preservation of forest land, the management of air quality, and the protection of water quality. The Plan identifies tools intended to improve the City's "green infrastructure" as new development and redevelopment occur. For example, compact site design techniques can minimize the impact of new construction on natural systems. Replanting developed sites with native vegetation can reduce runoff, save water, save energy, and improve air quality. Restoring the tree canopy also improves air and water quality and saves energy.

Frederick Watershed

The City of Frederick Municipal Forest and Watershed, also known as the Watershed, is about 7,500 acres of forested land that protects one of the City's four water supplies. Fishing Creek Reservoir provides the City with approximately 20%of its water supply and is solely under the City's control. The first parcel of land was purchased in 1870 and the first dam was constructed in 1899. The current reservoir was completed in 1924.

The Watershed's tributaries include Fishing Creek and Tuscarora Creek and their headwaters. The Watershed is valuable not only for its water supply, but also for its forest resources, wildlife protection, and recreational opportunities to the residents of Frederick. Maintaining control of this water supply is critical to the City's sustainability and resiliency. Other water resources, such as the Monocacy River, Linganore Creek, and the interconnection along the Potomac River, are all outside the City's control.

The Watershed is protected from development and must be preserved to ensure a sustainable, quality supply of water. In the area of the Fishing Creek watershed outside of the Municipal Forest, about 36% of assessed stream miles had inadequate riparian buffers and 25% had eroded banks. These impair the stream, making it difficult to support native wildlife and vegetation. Riparian buffers act as sponges, absorbing excess nutrients, trapping sediment, and protecting stream banks from erosion.

Maintenance and Recreation

Both Fishing and Tuscarora creek watersheds offer excellent trout fishing opportunities within the Watershed and are some of the few remaining brook trout streams in the region. The Tuscarora Creek watershed specifically is home to a genetically distinct brook trout population.

The forest is also a Tree Farm, certified through the Maryland Tree Farm Program, showing the City's commitment to sustainable resources. Established many years ago through a cooperative agreement with Maryland Department of Natural Resources (DNR), and the Watershed became a Wildlife Management Area to allow hunting, which helps protect the forest resources.

The City of Frederick is the sole owner of the land, but the City partners with others to help maintain and manage it. Forest resources are cooperatively managed with assistance from Maryland Department of Natural Resources (DNR) foresters; wildlife resources are managed by DNR Wildlife & Heritage staff. The City contributes to Maryland DNR for a full-time Forester and Forestry Tech position to manage the forestland. The wildlife resources are funded through the state's hunting license program and federal funds. The fisheries, such as pond stocking and put-and-take areas, are managed by DNR Fisheries and solely funded through that Department. The Watershed is patrolled by Frederick County Sheriff's Office and DNR Natural Resources Police for enforcement. The City is unable to police the area because it is not contiguous with City boundaries.

The Watershed contains an extensive trail system that is maintained by Mid-Atlantic Off-Road Enthusiasts (MORE), a non-profit, volunteer trail group. They obtain grant funding and fundraise to help pay for trail repair and maintenance. The trails are used by mountain bikers, hikers, hunters, horseback riders as well as many other recreators. All trails, except for the 12 miles of the Catoctin Blue Trail, were built without permission. In the last 5 years, the City worked with an ad hoc committee and Maryland DNR to determine which trails could be formalized in place, which could be rerouted from critical habitat, and which needed to be closed.

As a result of these efforts, the City developed a preliminary draft of the trail network. Some trails that would be closed could be rebuilt in the lower Watershed where there are few critical habitats. Each trail that is to be moved or built went through an exhaustive on-the-ground assessment to determine if there were rare, threatened, or endangered species, and specific routing to protect areas that might become critical habitats. The trails in the lower Watershed are expected to be completed by ~~spring 2020~~2022. The City is working with MORE to develop signs and over the next two years will be signing and blazing trails that will remain in the network long-term.

Municipal Watershed Conservation

The City must continually advocate for the protection of the Watershed, as it contains 22 threatened and endangered species alongside 12 species on the watch list. The Watershed is also home to multiple forest stands, each of which must be managed in a unique way depending on the stand's dominant species, its history, its benefits to wildlife, and its place in the Watershed's overall health.

Prescribed burns play a crucial role in forest stand management. It can clear away the leaf layer, known as duff, allowing oak and pine seeds to set while thinning out fast-growing maple and sweet birch, which would otherwise block sunlight and have less value to wildlife and can survive under the broader oak and pine canopy as a secondary layer. Pitch pine, a dominant species in several of the Watershed's stands, is a serotinous species, meaning half of its cones require fire to open and regenerate. As pitch pine stands near the end of the life expectancy, they are scheduled for prescribed burns.

The City also manages the forest through selective harvest, which is used to remove less-desirable species, such as maples, blackgum, and birch that have grown into the canopy. By selectively removing these less-desirable species more ecologically important trees like oak, beech, poplar, and hickory, have an opportunity to fill in the small openings created in the canopy. Larger trees are left to provide new seedlings. Without this selective harvesting, the forest would be maple-dominated, and wildlife populations would shift to match. This would be detrimental to many of the rare, threatened, and endangered species that call the Watershed home.

Deer management is also critical to forest protection. Without hunting, deer would quickly become overpopulated and eat the forest's young seedlings and saplings, leaving no future forest.

Threats

Although a tremendous resource of drinking water and recreation for the City and residents, the Watershed is degraded from a high number of users and careless patrons. The pressures of normal usage results in habitat encroachment and water contamination. Common illegal and egregious offenses like campfires, littering, dumping and off-road and all-terrain vehicles have even greater deleterious effects.

To balance recreation demand with resource conservation, roads have been gated and vehicle access reduced to a single entrance at Mountaindale Road. This allows for better monitoring and will reduce dumping and illegal vehicular activity. This initiative is a result of the City's Forest Stewardship Plan, which is currently being updated. The details of the road closure as well as many of the goals and policies guiding the Watershed can be found in that plan.

Water Quality

No environmental impact is more closely related to land use than water quality. The most significant waterway in the City of Frederick is the Monocacy River, one of the largest tributaries of the Potomac River and part of the Chesapeake Bay drainage basin. The Monocacy River Watershed covers roughly 1,000 square miles in Carroll, Montgomery, and Frederick counties. The river's headwaters lie in Pennsylvania. The river, together with its tributaries and wetlands, represents about 20% of the City's water resource. The Monocacy Scenic River Board was formed in 1978 to provide advice and recommendations to the Frederick and Carroll county governments on land use, land development proposals, and resource management issues that impact the river. Recently, the board spent two years updating the 1990 Monocacy River Management Plan, a process which ended with Carroll County voting to form its own board. As of the drafting of this Plan, Frederick County announced that it will form a nine-member Sustainable Monocacy Commission to improve water quality and maintain and restore the ecological health of the Monocacy.

Non-point-source (NPS) water pollution has the greatest impact on the City's natural resources. NPS pollution consists of stormwater runoff from streets, parking lots, rooftops, and lawns, among other things. This runoff carries nitrogen, phosphorus, oil, heavy metals, trash and other contaminants into rivers and streams. The policies of the Environmental Chapter emphasize the importance of onsite infiltration and stormwater detention using Best Management Practices (BMPs) to lessen the impact of non-point source pollution.

Ground Contamination

The City is home to Fort Detrick, which ~~has been assessing~~began testing for ground contamination from past operations ~~since 2010.~~during the 1990s. Those efforts resulted in the ~~commencement~~placement of a ~~pilot study~~tract of land in ~~2019~~/around "Area B" to ~~investigate and collect samples~~be placed on the EPA's National Priorities list. This requires studies to ~~assess~~determine the ~~potential~~degree of contamination~~.~~, future remedy's and ongoing monitoring.

A community advisory group, known as the Restoration Advisory Board (RAB) was created ~~to~~ to maintain cooperation and keep the community, government and Fort Detrick Officials informed of the clean up activities on the post. As part of the Comprehensive Planning process, several members of the community including those involved with the RAB have expressed concerns regarding future development in/ and around Area B. The City will continue to monitor the process as Fort Detrick continues to study the area and develops a remediation plan.

Mineral Resources

Historically, the city's industry has drawn on the natural resources of the region in addition to its agriculture. Founded in 1745 as a regional market center, timber, limestone, and iron ore attracted business-minded speculators. These industries

had their widest influence through the early nineteenth century. Within the city, limestone quarries were the primary mineral resource, with iron mines operating outside but in close proximity. The Schley limestone quarries, later Shank and Etzler Lime Company, was located on the east edge of Frederick adjacent to the west side of the Fair Grounds. The quarry produced a gray-white crystalline limestone for agricultural use. The quarry of the M.J. Grove Lime Company, Inc. was located at the southeast edge of the city. The company was founded in 1860 by Manassas J. Grove with his son William. By 1906, the company produced 1,000,000 bushels of lime a day and grew to be one of the largest industries in the county. The main plant of the M.J. Grove Lime Company was located in the village of Lime Kiln, south of Frederick. The clay pit at the plant of the Frederick Brick Works, Inc., also located in the southeast part of the city, used residual clays of Frederick Valley limestones in the product of brick. Building sand was obtained from the residues of weathered quartzose limestone with the largest sand pits being along US 15 on the south side of Frederick.

While mining has played an important part in the growth and development of the City, today there are no active mining operations within the City's boundary. As such, this plan does not designate a future land use designation specific to the mining of mineral resources. It should be noted that the Land Management Code permits mineral extraction and processing as a conditional use in the Heavy Industrial (M2) zoning district and this use may be permitted in areas designated that allow industrial types of uses.

Karst Topography

The Frederick Valley region of Maryland is known to have a fair distribution of karst topography, with a high concentration in the southeast quadrant of the City. Karst topography is characterized by numerous caves, sinkholes, fissures and underground streams. It usually forms in regions with consistent rainfall where bedrock consists of carbonate rich rocks, such as limestone, gypsum or dolomite that is easily dissolved.

The most common problems associated with urbanization in karst area are groundwater pollution through and groundwater collapse by sinkholes. Increased demand for water depletes aquifers, impervious surfaces concentrate runoff, and construction of on unstable ground is hazardous. The combination of depleting the aquifers of and surface runoff causing erosion create sinkholes and their sudden collapse.

A major concern of the City of Frederick is the depletion of acquirers through the pumping or redistribution of groundwater caused by the Martin Marietta Quarry, a mining operation located in the County, south of the City. Under a 1991 Amendment to Maryland's Surface Mining Law, the Maryland Department of the Environment (MDE) is required to establish and define Zones of Influence (ZOI's) around limestone and marble quarries in Baltimore, Carroll, Frederick, and Washington Counties. Limestone mining operations are required to repair a sinkhole within a ZOI if MDE determines that the sinkhole resulted from quarry

dewatering. Extraction companies are also required to replace a water supply that fails due to declining water levels caused by a quarry's pumping operation. The City of Frederick will coordinate with County and State officials to monitor these areas to protect the safety and property of residents and business owners.

Insert or recreate map found of Page 74:
https://www.frederickcountymd.gov/ArchiveCenter/ViewFile/Item/10952

Air Quality

Increased air temperatures in highly urbanized areas are common and the City of Frederick is no different. A 2019 temperature study in the City showed a 10-degree daytime difference, indicating a daytime urban heat island. This can be caused by increased impervious surfaces and reduced tree canopy, which can degrade air quality. "Increased daytime temperatures, reduced nighttime cooling, and higher air pollution levels associated with urban heat islands can affect human health by contributing to general discomfort, respiratory difficulties, heat cramps and exhaustion, non-fatal heat stroke, and heat-related mortality," according to the Environmental Protection Agency. Dedication to planting new and maintaining existing tree canopy will, over time, reduce the urban heat island effect and improve air quality.

Vehicle emissions are a major contributor to greenhouse gas emissions and can degrade air quality not only in the City, but the region. According to the Metropolitan Washington Council of Governments, the City's total greenhouse gas emissions have decreased since 2005, however, transportation still accounts for 50 percent of the total. Much of this can be attributed to long commutes and lack of adequate mass transit options outside the City and County. About 85 percent of the County's TransIT bus ridership is from the City, which helps reduce emissions within the City and County. There are other alternatives, such as on-road bike shared lanes and the shared-use path, however, those are used more for leisure than commuting.

Encouraging the adoption of electric vehicles, improving access to mass transit options outside the City and County, and providing competitive career opportunities within the Frederick area will be key to reducing greenhouse gas emissions from transportation and improving air quality.

Sustainability

Sustainability is balancing economic, social, and ecological needs for today and for future generations. Climate change requires adaptation and mitigation measures to protect environmental resources, homes, businesses, food production, transportation routes, and energy supplies.

Recognizing the importance of sustainability, the City created the Green Initiatives Team in 2012 to manage the City's sustainability goals and policies. As

a result of the team's recommendations, the City hired a Sustainability Manager in 2014. The Sustainability Manager is responsible for the development and implementation of environmental objectives in the areas of resource conservation, energy conservation, improving air quality and encouraging the use of renewable energy sources in the City. In 2016, the Green Initiatives Team became the Sustainability Committee, a standing committee of the City. The Committee is made up of seven members from different backgrounds who serve in an advisory capacity by providing input on plans, acting for the City on various topics, and educating the public.

Sustainability Plan and Implementation

In 2016, the City adopted the first Sustainability Plan covering the topics of Water Quality & Supply, Air Quality, Transportation, Energy, Waste & Recycling, Impervious Surfaces & Built Environment, Food & Nutrition, and Tree Canopy & Open Spaces. Implementation of the plan has been successful as each year additional projects are completed in most sections, moving the City towards a more sustainable future.

Energy

The City has been most successful at improving its energy efficiency. Despite a 7% increase in population since 2013 and an increase in facilities to accommodate these new residents, electricity use in City facilities has only increased by 0.5% during that time. In 2018, about 46.5% was used for water facilities, a very small increase from the 2013 proportion of 44%. Though the cogeneration system at the wastewater treatment plant lowers electricity use from the grid, enhanced nutrient removal (ENR) upgrades have increased the electricity demand at the plant.

Streetlights continue to generate approximately 25% off the electricity needed by the City government. Many streetlights have been upgraded to more energy-efficient LED bulbs, which can account for a stagnant electricity use despite the increase in lighting. LED lights will also save on future maintenance costs, as LEDs do not need to be changed as often as traditional streetlight bulbs.

Occupied government buildings accounted for 18% of the City's energy use in 2013. Where practical, HVAC and lighting are continually upgraded to the latest technology to reduce energy use. Unoccupied spaces, such as park pavilions and fields, accounted for approximately 13% of the City's energy use. Since the installation of LED at many of these facilities in 2013, the energy use has fallen to 10.5% in 2018.

In addition, the City has been replacing vehicles with hybrid models. In Fiscal Year 2020, the Frederick Police Department was approved to replace 15 vehicles with hybrids, and the City expects to continue this trend. As police vehicles make up most of the City's fleet, this can have an outsized role in reducing City energy

consumption. Lastly, the City is working on auditing the energy use for all buildings and improving them as recommended.

The most significant recent accomplishment was the approval to purchase renewable energy credits (RECs) for 100% of the electricity used at City facilities beginning in December 2020. A REC is a certificate that is produced when a renewable energy source generates one megawatt hour of electricity and delivers it to the grid. They can be kept, bought or sold. When they are kept or purchased, it supports renewable energy and allows the City to claim that electricity came from a renewable source. The benefit of RECs is that they allow the support of renewable energy without having to install or maintain renewable energy systems while also reducing the purchaser's carbon footprint.

Electric Vehicles

Electric Vehicles (EVs) are an important facet to reducing greenhouse gas emissions from transportation and improving air quality. The City's Plug-In Electric Vehicle Charging Infrastructure and Implementation Plan noted several opportunities for EV installation in public parking areas and noted the lack of parking facilities are often one major reason for not adopting EVs. Through a partnership with Potomac Edison, two electric vehicle charging stations were installed at the MARC station parking lot for public use in spring 2020. These Level II stations allow commuters and visitors to park their vehicles at the lot for charging while they visit or work. The City also is exploring partnerships with private commercial landowners to provide additional EV charging stations in public parking areas and will continue to install the facilities in City-owned lots in partnership with Potomac Edison where feasible.

Waste and Recycling

The City relies on Frederick County to provide recycling and landfill services. The County's landfill is at capacity and serves as a transfer station to haul waste to a facility in Pennsylvania. The City is the County's largest waste customer, producing about 27% of the overall waste that is trucked to the transfer station. Recycling throughout the Country has seen a major shift because overseas buyers will no longer purchase contaminated recycling. Containers with food or other residue, trash in the recycling bins, and non-recyclable items can quickly spoil an entire load of recyclables. The City and County must work together to educate the residents and monitor the waste being recycled.

Compost is the heaviest part of the waste stream and could be diverted to reduce about 30% of all waste going to the landfill. To facilitate its use, the City offers compost bins to residents at a reduced cost, but not many residents have taken advantage of the program. Considering the changes in recycling and the lack of landfill space, City residents and businesses have a mostly untapped opportunity to reduce our waste stream.

Transportation

There is increasing interest in active modes of transportation within the City. Construction of critical links in the shared-use path system, bike lanes, and sidewalks improve the network each year. The City has installed 14.09 miles of on-road bike facilities with 51.78 additional miles planned. Green-painted bike lanes were installed on North Market Street and yearly repairs and upgrades are made to the existing shared-use paths. As referenced in the Transportation Chapter, the City will launch a bikeways plan in the near future to comprehensively analyze routes to safety accommodate bikeways on various road types within the City.

In addition, each year the City allocates funds to improve crosswalks and curb cuts for ADA access, making the City safer and easier to access for all.

Frederick County TransIT, which serves the City and County, has been reporting a decrease in ridership that follows the national trends. It is important to note that approximately 85% of their ridership occurs within the City. It is important to note that the County is replacing its current combustion engine fleet with electric vehicles at a rate of two per year.

Water

Each year, volunteers collect trash from the City's Municipal Forest and Watershed; Rock Creek, and Carroll Creek during spring and summer cleanups. These cleanup efforts help reduce the amount of trash that travels downstream to the Monocacy and Potomac Rivers and improves habitat for fish, macroinvertebrates, birds and other animals. In 2019, the City completed its first stream restoration project by restoring 1,250 linear feet of Rock Creek. These efforts will continue with six additional stream restoration projects in the next five years. Stream bank assessments have begun for these projects with the hope for grant funding and construction to continue a yearly basis.

As mentioned in the Water Resources Chapter, the City is conducting a flood study with the assistance of the Army Corps of Engineers to evaluate stormwater and flooding issues in the vicinities of Motter Avenue, Monocacy Village Park, East Street to 14th Street, the 7th Street Shopping Center, and portions of the College Estates Subdivision.

Tree Canopy and Food

In 2003, as part of the Chesapeake Bay Program, the Chesapeake Executive Council, consisting of Governors of Maryland, Virginia, and Pennsylvania, and the Mayor of the District of Columbia, signed into effect the Expanded Riparian Forest Buffer Goals, which included the directive for the Urban Tree Canopy (UTC). In 2007, the City committed to participate in the State UTC with the jurisdictional goal of 40% canopy coverage within the municipal boundary. In an initial 2002 assessment of the City's canopy, tree canopy was estimated to cover approximately 12% of the land area. The 2009 UTC Report showed an increase to 14% and the latest assessment in 2017 shows that the City reached 20%

coverage; however, some of this increase maybe attributable to higher quality aerial imagery. The UTC Report also showed that approximately 45% of the City has low levels of vegetation and could serve as future areas for increasing tree canopy.

Air quality is dependent on tree canopy, pollutants from local and regional industry, temperature, and other factors. Per the 2020 City of Frederick Air Temperature Study conducted by the Hood College Center for coastal and Watershed Studies, there is an increase of summer daytime temperature of 10°F in the City compared to its rural surrounds, indicating that the City is an urban heat island. The City's tree canopy is one way to help reduce the impacts of the urban heat island while also filtering particulates from the air.

The City is committed to increase tree canopy, enlisting volunteers and staff to plant trees in public spaces around the City. To date, about 50 street tree pits in the downtown area have been refurbished with flexible pavement to allow stormwater to flow through and reduce soil compaction around the roots. Tree Frederick will begin a cost-share program in spring 2020 to encourage residential tree planting. The next Tree Canopy Assessment will be conducted in fall 2021 to determine if our efforts have been successful.

By incorporating food trees into the tree canopy, the City has also been able to increase food access. In 2018, food forests were incorporated into the planting schedule in Baker and Waterford parks that is accessible by the Shared Use Path. This is in addition to 72 City-managed community garden plots available to residents for a small fee.

These efforts lead to Frederick being designated as a Platinum Level Healthy Eating Active Living (HEAL) City in June 2018, signifying the City's leadership for its ongoing efforts to provide healthy food sources for all residents as well as providing alternative transportation routes and workplace wellness.

Historic Preservation

Historic preservation is an inherently sustainable practice. An immediate advantage of older and historic buildings is that the structure already exists. No energy or waste is necessary for its demolition and far fewer resources are needed for its reuse because much of the materials and infrastructure may already be in place. The repair and retrofitting of existing buildings can be considered the ultimate recycling project, but it also adds value to the community by protecting our neighborhood character and architectural heritage. After all, the greenest building is the one that is already built.

The adaptive use of older buildings for a new purpose is a sustainable alternative to new construction. It conserves land, maximizes the use of existing materials and infrastructure, and reduces waste and consumption while also preserving local historic character. Yet, there is often an assumption that historic buildings are inefficient and require significant retrofitting to make them "green".

However, according to the US Energy Information Agency, buildings constructed before 1920 are more energy efficient that buildings built between 1920 and 2000. Generally, buildings constructed before the advent of mechanical heating and cooling systems include energy-conserving features in the original design, such as transoms, high ceilings, and large windows for natural light and ventilation. Minor modifications can be made to existing buildings to accommodate their new use and systems can be upgraded to meet modern building codes. Further, the rehabilitation of traditional materials helps retain historic character while eliminating an unnecessary burden to our landfills. Often, these types of projects are subject to local review and are potentially eligible for local, state and federal funding.

High Performance Building Tax Credit

The City offers tax credits for High Performance Buildings with LEED or LEED-equivalent certification. Depending on the level of certification, the owner receives a tiered discount on the property taxes for a period of three or five years. To date, 22 buildings have received the tax credits, including 43 E 5th Street as well as select buildings in the East of Market and Sinclair Way Apartment complexes.

Climate Change Adaptation

As climate change alters our precipitation and weather patterns, we are seeing changes to our forests, waterways, and built environment. Climate change is inevitable, but there are adaptation strategies we can use to help reduce its impact on our residents. The City is developing a Climate Action Plan in partnership with Metropolitan Washington Council of Governments to outline key strategies to better equip the City to combat new stressors, such as increased temperatures, more frequent flooding, the likelihood of more power outages, potential restrictions on water resources, and other scenarios. The Plan is expected to be completed in late 2020.

Growth Policies

Frederick's municipal annexation policies, as discussed in the Land Use Chapter, will also have a major impact on how the City interacts with its natural surroundings. Development plans for annexed areas will take into consideration the effects of new development on surrounding natural resources. The City's policy choices will reflect an appropriate balance between development and resource protection, and the City will develop tools to help residents and businesses achieve that balance.

Open Space and Parks

Forest Conservation

The Maryland Forest Conservation Act (FCA) of 1991 was established under the Annotated Code of Maryland Natural Resources Article. The Department of Natural Resources is responsible for directing and monitoring each municipality

with planning and zoning authority to administer a forest conservation program. The City of Frederick began its forest program in 1993 with an initial ordinance, which since has been updated with State regulation changes accordingly. The FCA contains a minimal model ordinance along with mandated regulations, foremost being that any application for a subdivision, project plan, and grading or sediment control on 40,000 square feet of land or greater must comply with the Act and/or local jurisdictional ordinance. Reforestation and afforestation in critically sensitive land areas is listed as the top priority, following with options of lesser incremental priority to support increased tree plantings. Since inception of the program, the City has planted 165+ acres on public land and expended approximately $1,000,000 collected from development fees for the plantings. This is in addition to street trees and equipment for tree management.

Parkland

Under the analysis of the 2017 UTC Report, the residential area is the largest single land use category in the City with 69% of that area being green or open space. Institutional lands constitute the second largest land use category, consisting of 66% green space. The greatest percentage of green space in a land-use category is, not surprisingly, parkland area, with 89% vegetation coverage. Much of the parkland in the City derives from developers dedicating their critical floodplain and wetlands to be used as passive or active parkland, thereby satisfying parkland dedication requirements. Since environmentally sensitive land area make up much of the parks, planting the unbuildable and critical areas is of upmost importance to comply with the FCA and State goals to increase canopy.

[Insert Vegetation Infographic]

[BUMPOUT: To date, the City has planted over 90 acres of trees in public parks.]

Environmental Sustainability Policies and Implementation

ES Policy 1

Preserve and increase the tree canopy within the City by implementing the goals of the Urban Forest Management Plan:

IMPLEMENTATION

1. Reduce the amount of impervious cover and development-related tree loss:

    a. Evaluate the parking requirements to allow for shared parking between residential and non-residential uses, reduce parking minimum ratios, remove impediments that may prevent structured parking.

b. Consider revisions to the Land Management Code to improve the efficacy of tree planting in industrial, commercial, and institutional zones.

c. Reduce heat island affect by increasing the tree plantings and green space requirements in parking areas.

d. Enforce tree preservation regulations, targeting the preservation of trees measuring 12-inch DBH (diameter at breast height) and greater.

e. Ensure that the minimum space for street trees is adequate to allow the healthy growth of the tree, prevent interruptions to utility services, and reduce sidewalk buckling while maintaining safe and adequate pedestrian travel ways.

2. Establish and maintain maximum tree cover through Forest Conservation regulations:

a. Increase the monetary rate of fee-in-lieu of forest conservation in order to apply funding towards increasing and diversifying forest land.

b. Allocate fee-in-lieu contributions to afforestation with the goal of increasing the urban tree canopy.

~~b.~~c. Preserve specimen trees and/or mitigate with replacement of lost canopy where preservation is not possible.

~~c.~~d. Plant in priority areas such as stream buffers, floodplains, and wetlands and establish buffer standards to enhance the quality of streams, rivers, and isolated wetlands.

~~d.~~e. Acquire suitable land for forest conservation receiving and/or banking areas for the use of forest conservation funds.

e. Ensure forest conservation plantings are installed to specifications to achieve the appropriate survival rates and monitor executed easements to ensure that they are adhered to.

3. Achieve 40% tree canopy coverage in the City by 2030.

a. Update the Tree Canopy Report every five years for monitoring purposes.

b. Identify and preserve existing forest resource areas through acquisition or with protective easements.

c. Incentivize preservation of existing unprotected forest areas located on private property.

d. Establish guidelines to mitigate the removal of single mature trees on public and private land through the establishment of a Tree Board and/or permits and fees for removing trees.

e. Promote more plantings on institutional and industrial lands.

f. Initiate periodic inspections of residential/commercial/industrial sites with forest easement areas to assure plantings are being maintained in accordance with protection agreements and/or site plan enforcement agreements.

g. Provide educational programs to the community to promote planting and preserving trees.

ES Policy 2

Encourage protection and restoration of ecologically sensitive lands to protect water quality. Refer to Map EN-1 for locations of sensitive lands.

IMPLEMENTATION

1. Develop a plan to improve stream health. The plan must include the establishment of a riparian buffer zone by protecting and reestablishing native vegetation.

2. Protect and restore the ecological integrity of streams and forests by utilizing a series of watershed management tools to offset the impacts of development. These tools include:

   a. Implementing the Watershed Management Plan

   b. Explore overlay districts to protect rivers and their tributaries

   c. Encourage land and forest conservation

   d. Promote low-impact site design

   e. Support erosion control techniques

   f. Prioritize storm water management

   g. Control non-storm-water discharges

3. Continue to work with the Maryland State Department of Natural Resources and federal agencies under the Endangered Species Act to conserve and promote the conservation of natural habitats and rare, threatened, and endangered species in the region.

Commented [AG1]: [Insert Impervious Surface Coverage Bumpout]

ES Policy 3

Minimize the environmental impacts of development through Best Management Practices (BMP).

Commented [AG2]: [Insert BMP Bumpout]

IMPLEMENTATION

1. To mitigate non-point source pollution, provide stormwater management facilities adjacent to stream channels.

2. Encourage development while protecting the areas natural environmental features:

   a. Protecting the open space landscape, farmland, and/or natural habitats for wildlife by establishing the boundaries of conservation areas;

   b. Requiring development submittals to include a slope analysis to clearly depict proposed disturbance of steep slopes. Adopt standards for appropriate remediation techniques, including maximum slope provisions to prevent erosion and stream bank destabilization.

   c. Conduct analyses that identify priority wetland protection and restoration sites based on the characteristics, distribution, and function of existing wetlands in Maryland.

   d. Review the permitted impervious surface ratios to ensure the permitted ratios align with policies regarding climate change and flood resiliency.

3. Implement the strategies recommended by the United States Army Corps of Engineers Flood Resiliency Study to prevent devastating damage to private and public property and infrastructure.

ES Policy 4

Achieve energy savings and improved air quality by requiring energy-efficient site design and building construction

IMPLEMENTATION

1. In select areas, encourage mixed-use development that includes retail and/or employment centers as well as residential uses in order to encourage walkable, bikeable, and transit-oriented neighborhoods.

2. Encourage green building techniques such as Leadership in Environmental and Energy Design (LEED) or other energy efficiency standards for new construction.

3. Promote environmental education and sustainable design practices by offering green building informational literature and training for City staff, builders, and developers.

4. Incorporate Green Building principles into the historic guidelines for renovation and new construction. Encourage the use of energy efficient, recycled-content, and locally harvested materials where feasible, in addition to other green building practices.

5. Incentivize the adaptive reuse of existing structures.

6. For construction of new City buildings, require that energy efficiency certification be attained where feasible.

7. Encourage applicants on all renovation projects to consider retrofitting with green technologies.

8. Work in partnership with the County, State, and adjacent municipalities to reduce emissions and other pollutants from man-made sources.

ES Policy 5

Adopt a policy to minimize impact on local ecosystems, reduce greenhouse gases, and minimize carbon footprint.

IMPLEMENTATION

1. Better coordinate with the responsible entities to increase the availability and efficiency of solid waste collection for City businesses and residents, including trash, recycling, bulk collection and compost.

2. Increase outreach and educational activities to promote recycling and composting.

3. Support local farms and farmers to grow produce for local use, resulting in a reduction in greenhouse gases from transportation and fresher healthy options for our people.

ES Policy 6

Establish better connectivity through all modes of transportation within the City and to points outside the City.

IMPLEMENTATION

1. Prioritize shared-use paths, bike lanes, and additional TransIT stops for multi-modal transportation options.

2. Implement the findings of the 2020 Parking and Circulator study being considered by the City of Frederick.

3. Evaluate City roads for road diets to increase bike lanes, parking, stormwater facilities, tree planting areas, and sidewalk expansion for safety and additional economic development opportunities.

4. Prepare for connected and autonomous vehicles by ensuring local infrastructure is safe and capable to handle the demand.

5. Invest and partner with Frederick County and other municipalities for the expansion of the shared-use path to link with the other paths and park systems.

ES Policy 7

Evaluate and develop a plan for resiliency to better prepare for natural disasters, climate change, pandemics, and other emergencies.

IMPLEMENTATION

1. Develop a resiliency plan with Frederick County and regional municipalities to help the City, County and Region be better prepared for natural disasters, climate change, pandemics, and other emergency situations.

2. Assist in establishing microgrids for energy efficiency and resiliency.

3. Evaluate water supplies for sufficiency, particularly in drought situations that may become more frequent as climate change worsens.

4. Continue to assess specific areas of concern under current and projected conditions and address flood protection throughout the City.

ES Policy 8

Establish and maintain an annual environmental monitoring and evaluation system to measure progress toward achieving the goals of the Environmental Sustainability Chapter.

IMPLEMENTATION

1. Design and implement an environmental monitoring system.

    a. Invest in a computer modeling program to forecast canopy coverage for development designs in order to track acres and canopy of forest preserved and restored.

b. Develop Comprehensive Planting Plan to include the GIS overlay for the monitoring of forest conservation easements recorded and/or proposed within the City as a vital analysis tool.

c. Create an annual award program to a developer and/or a resident who demonstrates progressive sustainable design.

d. Monitor collected fees and installation of plantings in compliance with Forest Conservation Act (FCA) regulations.

ES Policy 9

Actively incorporate the considerations of underrepresented communities and low-income residents communities in environmental decision-making.

IMPLEMENTATION

1. Coordinate with community groups active among minority communities and with low-income residents for public outreach to elevate and include those voices in public discourse and decision-making.

2. Actively recruit underrepresented populations to advisory boards, committees, and other volunteer positions.

3. Identify areas where residents may suffer disproportionate impacts from environmental contamination and pollution.

4. Assess and ensure efforts to grow the tree canopy are inclusive of areas with low-income and at-risk populations.

5. Commission a comprehensive anti-racism plan with recommendations for environmental sustainability.